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URAL AND SYNTHETIC SWEETENERS

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NATURAL AND SYNTHETIC SWEETENERS

VOLUME 5

FOOD ANNOTATED BIBLIOGRAPHY No. 3

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INTRODUCTION

Food Annotated Bibliographies (FABs) are collections of abstracts on specific topics in food science and technology. The topics are chosen by the staff of the International Food Information Service as being of particular interest or importance. The topics normally interest individual workers, who may not require the full information provided in Food Science and Technology Abstracts, from which the abstracts for the FABs are taken. The size and the cost of the FABs are controlled as much as possible with the interests of individual workers in mind.

Titles of the FABs now available are given on the back cover of this booklet. New titles are being added at the rate of about 10-20 per year. For up-to-date lists of FABs or suggestions for new topics please write to the address given overleaf. New subjects are searched for at least the five most recent volumes of Food Science and Technology Abstracts. Thereafter each FAB is updated monthly. Copies of each months abstracts on any topic may be obtained as indicated on the back cover of this publication. At the end of each volume of up-dating, the abstracts are merged and made available as a separate supplement to the original FAB.

Some of the larger FABs have been divided into sections to facilitate use. Abstracts are not printed in more than one section. The larger FABs also have subject indexes provided.

Copies of all original articles referred to in the abstracts may be bought (or occasionally borrowed) from the International Food Information Service. A form for ordering these is provided at the end of this FAB.

Coverage of the subject has been restricted to that of Food Science and Technology Abstracts, which covers over 1200 of the important food journals, patents from 20 countries and books published world-wide. Every effort is made to include all significant references, but editorial discretion is used on the many articles of borderline interest. If the reader particularly needs an exhaustive search of the subject, we will be pleased to provide any other references that we have available. We would in any case encourage readers to write or telephone us with any comments or queries they may have.

J. NEWTON
ASSISTANT EDITOR

1 L 15
How to control moisture migration in composite products. I.
Cakebread, S. H.
Candy and Snack Industry **137** (4) 24-26, 70 (1972) [4 ref. En] [Knechtel Lab. Ltd., Skokie, Illinois, USA]

The term 'water activity' is explained and its method of calculation described. Moisture migration was studied in 2 composite candies, namely a fondant-jelly composite and a caramel-marshmallow confection. Analyses of the components of the different layers of the composite confection are given. The effect of altering the moisture content of each layer while keeping the proportion of the other ingredients the same was calculated. Replacement of the 42 DE (dextrose equivalent) by 63 DE corn syrup or use of invert sugar instead of corn syrup reduced water activity. The suitability of using one desired component with another can be at least partially assessed in advance by calculating the water activity of each. VJG

1 L 26
Making hard candy without corn syrup.
Kreiten, K.
Manufacturing Confectioner **52** (4) 45-46, 48-50 (1972) [En] [Gerhard Hanke KG, Norf, Federal Republic of Germany]

An outline is given of classical and modern confectionery manufacture which considers the steps in cooking needed to produce a satisfactory end product using glucose syrup. As a substitute the use of invert sugar produced during normal cooking or the use of a standard invert solution are discussed. Cream of tartar is recommended for the former process and the preparation of standard invert solutions using cream of tartar, and phosphoric, lactic or citric acids is considered. A number of basic rules for formulation is given but each formula must be designed to suit the equipment and the temp. profile of the process; examples are given for open fire, vacuum batch and continuous cooking. WHCA

1 P 14
Measurement of ice cream texture with the constant speed penetrometer.
Tanaka, M.; Pearson, A. M.; deMean, J. M.
Canadian Institute of Food Technology Journal **5** (2) 105-110 (1972) [13 ref. En, fr] [Dept. of Food Sci., Univ. of Guelph, Ontario, Canada]

A constant speed penetrometer was used to evaluate ice cream firmness. The cones of the penetrometer were found to give curves that could be used to calculate the yield value and apparent viscosity of the ice cream. Variations in air content, or overrun, were inversely related to both the yield value and apparent viscosity. Samples containing (i) 15% sucrose, (ii) 10% sucrose, 5% maize syrup solids, (iii) 5% sucrose, 10% maize syrup solids, (iv) 15% maize syrup solids and (v) 15% dextrose showed that the greater the fp depression the lower was the yield value. Organoleptic ranking of firmness was generally in good agreement with the yield values obtained from penetrometer data. JR

1 P 35
[Manufacture of a fermented milk product.]
Verfahren zur Herstellung eines Sauermilchproduktes.
Fekete, K.; Büchi, W. (Knorr-Nährmittel AG)
Swiss Patent 521 092 (1972) [De]

Vegetable and/or fruit yoghurt is prepared by mixing fresh milk (whole or skim-milk) with vegetables or fruits or components of these, heating the mixture for preferably 10-60 min, and then cooling and inoculating it. 0.5-30.0% sugar or an artificial sweetener, as well as stabilizers, may be added before fermentation. The fermented product can be sterilized or dried. After sterilization at 110°C, a skim-milk yoghurt containing shredded carrots and additives (maize starch, locust bean flour, sugar and a small amount of lemon juice) has a shelf life of ≤3-6 months at room temp. W&Co

1 T 14
[Analysis of food additives. XX. Colorimetric determination of sodium cyclamate in foods.]
Kawana, K.; Wada, Y.; Takahashi, T.; Kanno, S.
Journal of the Food Hygienic Society of Japan [Shokuhin Eiseigaku Zasshi] **12** (1) 33-39 (1971) [5 ref. Ja, en] [Kanagawa Prefectural Public Health Lab., 52-2, Nakao-cho, Asahi-ku, Yokohama, Japan]

Sodium cyclamate was separated from foods by ultrafiltration and determined by a colorimetric method. The experimental conditions for colorimetric determination of cyclohexyl nitrite was examined using 2 reagents such as sulphanilamide and n-1-naphthylethylenediamine dihydrochloride. The recovery ratio of sodium cyclamate was about 90%. Min. detectable concn. of sodium cyclamate was 50 ppm in juice and 500 ppm in the other foods. [See FSTA (1971) **3** 11T574 for part XIX.] TM

1 T 25
[Cycloalkylsulphamic acids and their salts. III.]
Cycloalkylsulfaminsäuren und ihre Salze. III.
Unterhalt, B.; Böschemeyer, L.
Zeitschrift für Lebensmitteluntersuchung und - Forschung **149** (4) 227-229 (1972) [5 ref. De, en] [Fachbereich Pharmazie und Lebensmittelchemie, Univ., Marburg (Lahn), Federal Republic of Germany]

Some synthetic sweeteners, e.g. the sodium salts of cyclononylsulphamic acid and methyl-substituted cyclopentyl- and cyclohexylsulphamic acids, are described (mp, mol. wt., formulae). Cycloalkylsulphamic acids and alkylsulphamic acids are compared. [See FSTA (1971) **3** 8T208 for previous part.] AS

U 55
Specification for glucose syrup (liquid glucose).
Malaysia, Standards Institution of Malaysia
Malaysian Standard **MS 3.7:1971** 14pp. (1971) [En] [Kuala Lumpur]
Glucose syrup shall be clear, transparent, free from foreign odour, taste or matter and conform to the following requirements: TS, min. % 75; dextrose equivalent, min. % dry basis 25; sulphated ash, max % dry basis 0.5; SO_2, max. ppm 40, or for sugar confectionery manufacture only 450; As, max. ppm 1.0; Pb, max. ppm 2.0; Cu, max. ppm 2.0. Specifications are given for packaging and marking and selection and preparation of samples for analysis. Detailed techniques are prescribed in appendices for determination of TS (by vacuum oven drying) and dextrose equivalent (by Lane and Eyon cuprimetric procedure). ELC

2 A 89
[Consideration of the possible relationship between chemical constitution and sweet taste.]
Betrachtungen über mögliche Beziehungen zwischen chemischer Konstitution und süssem Geschmack.
Hofmann, H. H.
Ol76bd **25** (8) 162-163 (1971) [6 ref. De]
A review of present theories on the relation between chemical constitution and sweet taste, with a suggested mathematical relationship, is given. Attention is drawn to the possible significance of "intrinsic activity" (ability to fill a vacant space and thereby produce max. sensitivity) as opposed to "affinity" resulting from adhesion. ELC

A 100
[Non-volatile compounds and food flavours.]
Nichtflüchtige Verbindungen und Lebensmittelaromen. [Review]
Solms, J.; Hoehn, E.
Dechema-Monographien **70**, 337-352 (1972) [78 ref. De, en, fr] [Agric.-Chem. Inst., Eidgenössische Tech. Hochschule, Zurich, Switzerland]
The flavour effects of non-volatile compounds are discussed with special reference to sugars, sugar:acid ratio, amino acids and peptides (including bitter peptides), nucleotides and synergistic effects between amino acids and nucleotides, using examples from published data. M

87
[Alcohol-containing candy.]
Morinaga Confectionery Co. Ltd.
Japanese Patent 34 140/72 (1972) [Ja]
The alcohol-retention capacity of hard candy is increased by combining the alcohol with mixtures of sorbitol and sugar alcohols. IFT

2 L 128
[Process for the manufacture of confectionery products, particularly sweets.]
Generale Alimentaire
French Patent 2 097 673 (1972) [Fr]
Confectionery products, e.g. caramel, are made from a syrup containing sucrose and a starch hydrolysate, ≥0.5 of which consists of polysaccharides of >7 glucose units and which has a dextrose equivalent of ≤30. The syrup is cooked continuously and for a sufficiently short period to prevent formation of invert sugar. W&Co

2 L 137
[Effect of sugar and invert sugar on the structure of foamed sugar confectionery.] Einfluss von Zucker und Invertzucker auf die Struktur von Schaumzuckerwaren. [Lecture]
Krüger, C.
Süsswaren **16** (8) 321-326; (9) 368-371 (1972) [17 ref. De] [Anwendungstechnische Abteilung der "Hildesia" Zucker-Vertriebsgesellschaft mbH, Braunschweig, Federal Republic of Germany]
The physical and chemical properties of sugar (particularly solubility, viscosity and crystallization characteristics) are generally modified during the manufacture of sugar confectionery by combination with other grades of sugar or sugar alcohols (invert sugar, dextrose, glucose syrup, sorbitol etc.). A detailed discussion is given of changes in the structure of foamed sugar confectionery from differences in sweetening power, solubility, bp and DM contents of the basic material. The effects of environmental RH on moisture uptake or loss by the product, and of viscosity (itself primarily a function of moisture content and temp.) on the whipping characteristics and stability of the basic mass are also described. IN

2 M 142
[Fried bread crumb cake product.]
Torikoshi, M.
Japanese Patent 34 138/72 (1972) [Ja]
Mixtures of bread crumbs, wheat flour, and sweetening agents are mixed with yeast and fruit juices to yield a dough which is formed and fried in vegetable oil. IFT

2 T 54
Artificial sweeteners.
Organon Laboratories Ltd.
British Patent 1 287 373 (1972) [En]
Sweetening compositions are prepared by reacting in ethanol, saccharin and a bitter substance, such as quinine or magnesium sulphate. IFT

2 T 55
Artificial sweeteners.
Hill, J. A.; LaVia, A. L. (E. R. Squibb & Sons Inc.)
United States Patent 3 695 898 (1972) [En]
The sweet taste of saccharin is potentiated and its after-taste masked by incorporation of sweet-tasting dipeptides. IFT

2 T 71
Some aspects of the toxicology of natural and synthetic flavouring agents. (In "Proceedings of the 3rd Nordic Aroma Symposium.")
Tuomisto, J.
pp. 182-202 (1972) [En] [Dept. of Pharmacology, Univ. of Helsinki, Finland]

The toxicity of the following substances is discussed : spices and other natural flavourings e.g. oil of sassafras, micranthum oil, nutmeg, mace, parsley, celery, dill, coumarin, absinthe, mustard, capsicum spices, peppermint and menthol; synthetic flavouring agents ; sweetening agents e.g. cyclamate and saccharin; flavour enhancing agents e.g. monosodium glutamate, NaCl and ethyl maltol; and condiments e.g. mustard and Worcester sauce. AA

2 T 81
Quantitative conversion of cyclamate to N,N-dichlorocaclohexylamine, and ultraviolet spectrophotometric assay of cyclamate in food.
Hoo, D.; Hu, C.-C.
Analytical Chemistry 44 (12) 2111-2113 (1972) [5 ref. En] [Dept. of Biochem. & Biophysics, Univ. of Hawaii, Honolulu, USA]

A rapid method for determination of cyclamates in foods by UV spectrophotometry of the N,N-dichlorocyclohexylamine formed by treating an acidic aquous extract of food with excess Cl_2 or hypochlorite is described. Cyclamate at concn. >0.001% in liquid foods could be determined. Average recovery for 5 or 10 mg added to 100 ml fruit juices, cola, soy sauce, pork lean extract, fish extract, 5% suspension of dried milk or 30% suspension of vanilla ice cream was 102.2 ± 1.8%. JN

2 T 93
[Food additives.]
Vitali, G.
Industrie Alimentari 11 (10) 73-84, 86 (1972) [26 ref. It] [Instituto Tecnica Commerc. "A Bordoni", Pavia, Italy]

The chemical composition of compounds added to foods deliberately or accidentally is reviewed under the headings: preservatives; antiseptic agents (aliphatic and aromatic acids, inorganic derivatives): antibiotics; antioxidants; gelling and thickening agents; emulsifiers; aromatic agents; colourants; enzymes; and sweeteners. HBr

2 T 96
[Method for manufacturing non-cariogenic food products containing a sweetener.] Verfahren zur Herstellung von Süssmittel-haltigen, zahnschonenden bzw. nicht kariogenen Lebens- und Genussmitteln.
Böhni, E. (F. Hoffmann-la Roche & Company AG)
Swiss Patent 524 319 (1972) [De]

Non-cariogenic, sweetened food products are obtained by partly or completely substituting the commonly used sweeteners, e.g. glucose or sucrose, by xylite, which has approx. the same sweetening power as ordinary sugar. Xylite is particularly suitable for use in sweets and chocolate; it may also be used in jam, instant powder for effervescent fruit drinks, biscuits and for making sugar cubes. It has been shown that highly cariogenic strains of streptococci are unable to break down xylite. W&Co

2 T 97
Artificial sweeteners.
Finley, J. W. (USA, Secretary of Agriculture)
United States Patent 3 702 255 (1972) [En]

Artificial sweetening compositions are based on kynurenine derivatives. IFT

2 T 98
[Artificial sweeteners.]
Fukumoto, J.
Japanese Patent 19 088/72 (1972) [Ja]

Mixtures of flavonoid glucosides and starch or starch hydrolysates are treated with an α-amylase to yield artificial sweeteners of high solubility. IFT

3 H 392
[Beer for diabetics.] Diabetes und Diätbier. [Lecture]
Mändl, B.; Wullinger, F.; Wagner, D.; Binder, W.; Piendl, A.
Brauwissenschaft 25 (11) 346-353 (1972) [18 ref. De, en, fr] [Inst. für Tech. Mikrobiol. & Tech. der Brauerei II, D-8050 Weihenstephan, Federal Republic of Germany]

The physiological characteristics of diabetes mellitus of importance to the dietetic beer products, the technique of producing beer for diabetics, and the composition of 12 commercial Pilsner diabetic beers are given. The compositional data, given in tabular form, cover general composition (including pH, colour, viscosity, isohumulones, anthocyanogens, head retention, cold stability, soluble N, attenuation limit); contents of fermentation by-products (including acetaldehyde, ethyl acetate, n-propanol, isobutanol, isoamyl acetate, 2- and 3-methylbutanol-1, pentadione-2,3 and diacetyl); contents of glycerine and organic acids; and contents of amino acids. HBr

3 J 332
[The importance of enzymes in fruit processing.]
Die Bedeutung von Enzymen bei der Fruchtverarbeitung.
Pilnik, W.; Rombouts, F. M.
Dechema-Monographien 70, 187-202 (1972) [39 ref. De, en, fr] [Landwirschaftliche Hochschule, Abt. für Lebensmittelwissenschaft, Wageningen, The Netherlands]

The roles of natural and added enzymes in fruit technology are illustrated with apple products (juice and sauce). Examples include prevention of oxidative browning by addition of ascorbic acid, inactivation of phenolases by CO gassing, pectolytic maceration, antiphenolases (e.g. O-methyl

nsferase, protocatechnate oxygenase), or
dizing all precursor polyphenols to insoluble,
erable brown pigments, aroma formation by
dation of linolenic acid to hexenal by
oxygenase. Enzymes briefly discussed include
ctolytic enzymes in connection with juice
rification, good juice and colour yields,
ssability of fruit pulp, cloud stability of citrus
ces, amylase for apple juice clarification,
cosidase for splitting hesperidin to produce a
eetening agent. RM

213
hewing gum base.]
tte Co. Ltd.
panese Patent 20369/72 (1972) [Ja]
Chewing gum base materials are produced by
ymerization of vinyl acetate in the presence of
eeteners. IFT

214
erchandizing of starch, sugar and confectioner's

ods. 2nd edition.] Tovarovedenie krakhmala,
khara i konditerskikh tovarov. [Book]
yuer, V. S.
8 pp. (1971) [13 ref. Ru] Moscow, USSR,
latel'stvo 'Ekonomika' Price 0.80 r
This textbook for students in Faculties of
erchandizing of Commercial Institutions of
gher Learning, consists of the following main
apters: Starch and starch products (pp. 6-
); Sugar, sugar syrups, honey, artificial and new
eetening agents (pp. 37-78); and confectioner's
ods (raw materials; physico-chemical properties;
ckaging, labelling, storage and transport; range of
ods; chocolate and cocoa; caramels; sweets;
lva; flour confectionery; and quality evaluation)
p. 81-233). Tables of chemical composition and
orie content are appended. SKK

320
eakfast cereals.
tional Biscuit Co.
itish Patent 1 293 453 (1972) [En]
Honey-graham flavoured quick-cooking product
nprises mixtures of whole wheat flour and/or
ite wheat flour and sweetening agents. IFT

131
olation and characterization of thaumatin I and the sweet-tasting proteins from Thaumatococcus niellii Benth.
el, H. van der; Loeve, K.
uropean Journal of Biochemistry **31** (2) 221-225
972) [17 ref. En] [Unilever Res., Vlaardingen,
e Netherlands]
2 sweet-tasting basic proteins named (i)
aumatin I and (ii) thaumatin II, were isolated
om an aqueous extract of the fruit of
aumatococcus daniellii Benth, by ultrafiltration,
l filtration and ion-exchange chromatography.
The proteinaceous character of (i) and (ii) was shown by the characteristic UV absorption spectrum, the presence of almost 100% polypeptide material (determined by the biuret method), the yield of 100% amino acids on hydrolysis with 6N HCl, the positive reaction with amino black, and by the disappearance of the sweet taste of the compounds after incubation with trypsin. The isoelectric points of (i) and (ii) are almost 12 and they precipitate at pH 12. Sweetness of the proteins is lost by heating for a few min at >75°C, on splitting of the disulphide bridges in the molecule with a 0.5M cysteine solution, and at pH values <2.5. (i) and (ii) have an intensely sweet taste, the degree of sweetness being about 1600 times higher than sucrose on a weight basis or 10^5 times on a molar basis. Threshold values are near 10^{-4}% or 48nM. AA

3 T 145
[On the colour reactions of sweetneners.]
Matsumoto, S.
Annual Report of Tokyo Metropolitan Research Laboratory of Public Health **21**, 89-92 (1969) [3 ref. Ja, en] [Tokyo Metropolitan Res. Lab. of Public Health, Japan]
Methods for the detection of sweeteners are discussed including: NO_2 oxidation followed by $BaSO_4$ determination using colour reagents, for cyclamate ; and fluorescence tests using auramine or α-naphthylamine solutions under UV light, for saccharin, dulcin and cyclamate. [From En summ.] AA

3 T 146
[Studies on a new paper chromatographic method for detecting cyclamate and its application to the analysis of synthetic sweetenings in foods.]
Nishigaki, S.; Nishizima, M.; Tamura, Y.; Matsumoto, S.
Annual Report of Tokyo Metropolitan Research Laboratory of Public Health **21**, 45-46 (1969) [3 ref. Ja] [Tokyo Metropolitan Res. Lab. of Public Health, Japan]

3 T 147
[Studies on quantitative analysis of saccharin in artificial sweeteners by polarography.]
Endo, F.; Iguti, M.; Hirokado, M.; Aoyagi, K.
Annual Report of Tokyo Metropolitan Research Laboratory of Public Health **21**, 67-69 (1969) [4 ref. Ja]

3 T 165
Low-calorie sweetener.
Mitsuhashi, M.; Hirao, M.; Sugimoto, K. (Hayashibara Co.)
United States Patent 3 705 039 (1972) [En]
A liquified starch solution is subjected to the action of an α-1,6-glucosidase and saccharified to yield a mixed saccharification product which is then hydrogenated to produce a non-digestive linear-chain sweetener mixture of maltitol and maltotritol. IFT

3 T 166
Low-calorie sweeteners.
LaVia, A. L.; O'Laughlin, R. L.; Walton, R. W. (E. R. Squibb & Sons Inc.)
United States Patent 3 704 138 (1972) [En]
Mixtures of hydrolysed corn starch, arabinogalactan and artificial sweeteners are in the form of granular, free-flowing solids similar in appearance to ordinary cane sugar. IFT

3 T 167
[Low-calorie sweetener.]
Hayashibara Co. Ltd.
Japanese Patent 41027/72 (1972) [Ja]
Low-calorie food and drink compositions employ as a sweetener a mixed sugar of 4-O-α-D-glucopyranosyl-α-D-fructose and 4-O-β-maltosyl-α-D-fructose obtained by isomerization of a high maltose sugar derived from the hydrolysis of starch. IFT

4 A 172
Structural basis of and interaction between sweetness and bitterness in sugars.
Birch, G. G.; Cowell, N. D.; Young, R. H.
Journal of the Science of Food and Agriculture **23** (10) 1207-1212 (1972) [11 ref. En] [Nat. Coll. of Food Tech., Univ. of Reading, St. George's Avenue, Weybridge, Surrey, UK]
The relationship between concn. and subjective intensity of (a) sweetness and (b) bitterness have been separately determined and the effect of each on the subjective intensity of the other has been evaluated. The depression of sweetness by bitter additives, or bitterness by sweet additives obeys a simple mathematical relationship which may be used to calculate the "true" sweetness of a bittersweet sugar. This facilitates the structural explanation of sweetness in model sugars. AS

4 E 137
Agglomeration processes in food manufacture.
Pintauro, N.
Food Processing Review, Noyes Data Corporation 25, vi+270pp. ISBN 0 8155 0426 8 (1972) [En] Park Ridge, New Jersey 07656, USA, Noyes Data Corp. Price $36.00
This book covers US patents since 1960 relating to agglomeration processes and techniques suitable for food manufacture. The subject is covered under the chapter headings: Nonfat dry milk (pp. 2-45); Chocolate drink powders (pp. 46-79); Whole milk and other dairy products (pp. 80-101); Natural sugars and synthetic sweeteners (pp. 102-140); Soluble coffee and soluble tea (pp. 141-174); Flour and cake (pp. 175-221); and Other agglomeration processes (pp. 222-265). A company index, an inventor index, and a US patent number index are given. JN

4 G 206
Mousse desserts.
General Foods Ltd.
British Patent 1 295 983 (1972) [En]
Mousse-textured desserts are formed from a 2-part powder mix comprising: a 1st powder which is a dried emulsion of an edible fat, and emulsifier, protein and sweetener, which when whisked with milk or water forms a whipped product with stiff peaks; and a 2nd powder containing a gelling agent, a foaming agent and a tangy acidic flavouring compound, e.g. citric acid, which when whisked with cold water forms a stiff foam. IFT

4 H 665
[Scallion brandy.]
Japan, Fujui Prefecture
Japanese Patent 45 519/72 (1972) [Ja]
A scallion brandy preparation, free from undesirable flavours, is prepared by ageing a spirit composition containing scallions, deodorizing the resultant product, and adding a dried powder of laurel leaf and carrot leaf along with sweetening and flavouring agents. IFT

4 J 541
Sweet taste of water induced by artichoke (Cynara scolymus).
Bartoshuk, L. M.; Lee, C.-H.; Scarpellino, R.
Science, USA **178** (4064) 988-990 (1972) [En] [Yale Univ., 290 Congress Avenue, New Haven, Connecticut 06519, USA]
The sweetness of water after exposure of the tongue to artichoke extracts for 2 min was determined for 27 male and 13 female subjects. Extracts from quarter artichoke heart (10 ml 2.75% solution) made water taste as sweet as 2 teaspoons of sucrose in 6 oz H_2O. Chlorogenic acid and cynarin were isolated from artichoke extracts and were found to account for approx. 29% of the induced sweetness. JN

4 L 229
[Various boiled sugar centres for dragees.]
Kreiten, K., Jr.
Revue des Fabricants de Confiserie, Chocolaterie, Confiturerie, Biscuiterie **47** (3) 20, 24, 27-28; (4) 19, 21-22, 24, 26, 28-29 (1972) [Fr] [Silesia Gerhard Hanke KG, Düsseldorf, Federal Republic of Germany]
Boiled sugar centres for dragees are classified as: (i) recrystallized (e.g. after-dinner mints); (ii) well cooked to provide a hard exterior wall with a liquid centre (e.g. liqueur chocolates); and (iii) molten caramel centres with a lining of fruit or chocolate. Recipe types given include: for (i) water, cream of tartar and high quality granulated sugar; for (ii) water, sugar, glucose syrup and 7% sorbitol; and for (iii) water, skim-milk, hard fat (cocoa butter), granulated sugar, brown sugar, glucose syrup (36-40 DE) and salt. In all cases flavourings and colours may be added to choice. LA

L 258
ovel confectionery product.]
nerale Alimentaire
nch Patent 2 112 564 (1972) [Fr]
A confectionery product of the caramel type
nprises a mixture of 15-20% (by wt.) dextrose and
-85% macromolecular starch hydrolysate, ≥¼ of
ich consists of polysaccharides of >7 glucose
its. The dextrose equivalent of the hydrolysate is
0. Mixing may be continuous or intermittent at
n. pressure or under vaccum. Where vacuum is
d, the dextrose is sprinkled onto water at 70°C
d the temp. then raised to 80°C. When the
xtrose has melted, the hydrolysate is added,
xed in and, finally, melted at 110°C. Good test
sults have been obtained with cooking at 140°C
d 70 mm Hg. W&Co

L 285
mposium of the AIFC (Association
ternationale des Fabricants de Confiserie) held at
e central technical school in Solingen on 17-19
ril, 1972.] Gelungenes Symposium der AIFC an
r Zentralfachschule in Solingen vom 17.-19.4
72.
big, A. W. (Association Internationale des
bricants de Confiserie)
sswaren 16 (10) 421-424, 426-428 (1972) [De]
Brief reports are given of the following papers
ich were presented at the symposium: Method of
imating moisture content during manufacture of
ar confectionery, by A. C. Slight; Possibility of
ermining the suitability for storage of sugar
fectionery by a rapid test, by A. C. Sansome;
termination and evaluation of off-odours and loss
flavour during manufacture and storage of sugar
fectionery, by M. J. Saxby; Composition of hard
amels in relation to their suitability for storage,
G. Andersen: Crystallization problems in sugar
ducts, by -. Chaveron; Studies of prevention of
es, by B. Cohen; Use of sugar alcohols in the
nufacture of sugar confectionery, by -.
nmerer; Manufacture of foamed sugar
fectionery, by -. Mansvelt; Use of gum arabic in
manufacture of sugar confectionery, by -.
liotti; Variations in filled volume in packages of
ar confectionery - technical and statistical
blems; Experience and progress in the field
owderless pouring, by -. Jeffery; and Language
blems in the enlarged EEC, by E. Rapp. JA

321
ixtures of liquid sugar and starch hydrolysates
their use.] Mischungen aus Flüssigzucker und
rkeverzuckerungsprodukten aus
endungstechnischer Sicht.
iger, C.; Steinmetzer, W.
cker 25 (11) 356-360; (12) 396-401 (1972)
ref. De, en, fr] [Zucker-Vertriebsgesellschaft
H, 33 Braunschweig, Schmalbachstr. 7, Federal
ublic of Germany]
he advantages and disadvantages of liquid sugar
tures are discussed. Technological problems
e been related to discoloration during storage,
ing solubilities of component sugars, viscosity,
ilibrium RH and microbiological stability of
mixed syrups and their effects in sugar-containing foods. Experiments were carried out on discoloration during storage, sp. wt. of protein-sugar foam mixtures (70% sugar) and viscosity of sugar mixtures with 66.5% DM at 25°C, sorption and desorption of 70% syrups at 63% and 80% RH and deleterious activity of yeasts in invert sugar solutions of 60% to 77% DM and 70% DM mixtures. In no case did discoloration exceed 25 ICUMSA units after 21 days, storage. Highest viscosity was obtained with 70% sucrose + 15% glucose syrups (dextrose equivalent (DE) 42) + 15% dextrose. Mixtures of 60% sucrose with 40% dextrose or 40% invert sugar suffered less desiccation than those with 40% glucose syrup (DE 42). Invert sugar solutions of <77% DM supported growth of osmophilic yeasts. No growth occurred in 70% DM liquid sugars of 100% sucrose, 100% glucose or 60% sucrose + 40% invert sugar, while 60% sucrose + 40% glucose or 40% dextrose supported growth. RM

4 L 322
Mixed sugars.
Hayashibara Co.
British Patent 1 294 478 (1972) [En]
Process for preparing mixed sugars involves addition of sugar solutions containing >40% by wt. fructose to a starch syrup containing >30% by wt. maltose, refinement of the solution, and concn. to a syrup of drying to a powder. IFT

4 L 326
Candy manufacture.
Generale Alimentaire
British Patent 1 295 006 (1972) [En]
Process is described for the preparation of hard caramel or boiled sugar sweets prepared from mixtures of dextrose and a macromolecular hydrolysate of an amylaceous substance, >½ being polysaccharides of >7 glucose units. IFT

4 P 487
[Use of special syrups in ice-cream manufacture.]
Einsatz von Spezialsirupen bei der Eiskrem-Herstellung.
Kropp, E.
Süsswaren 14 (3) 95-96, 98-101 (1970) [De]
In this review-type article, the author gives general data (DE values, composition, dosage) for various sugars and soluble carbohydrates, discusses advantages of the use of glucose syrup in ice cream manufacture, and finally deals briefly with ice cream for people suffering from diabetes. FL

4 T 188
[Artificial sweeteners.]
Hayashibara, T.
Japanese Patent 42506/72 (1972) [Ja]
Low-calorie sweetened compositions containing lactitol are obtained by hydrogenation of lactose on a nickel catalyst. IFT

4 T 212
[A new sweetening agent of the indole series.] Ein neuer Süssstoff aus der Indolreihe.
Hofmann, A.
Helvetica Chimica Acta **55** (8) 2934-2940 (1972) [3 ref. De, en] [Pharmazeutisch-Chem. Forschungslab. Sandoz AG, Basle, Switzerland]

The synthesis of 3,4-dehydro-2-(-3-indolylmethyl)-1-methyl-piperidine-4-carboxylic acid, a new dulcifiant of the indole series which is twice as sweet as saccharin is described. The compound (glykergic acid) is structurally related to lysergic acid but showed no pharmacological activity. Preliminary tests with rats gave LD_{50} of 300 mg/kg after oral administration. RM

4 T 222
[Sweetening substances of plant origin.]
Heraud, G.; Dupaigne, P.; Moyal, M.-F.; Roux, E.
Cahiers de Nutrition et de Dietetique **7** (2) 139-143 (1972) [27 ref. Fr]

Descriptions are given of the following plants: Dioscoreophyllum cumensii, Thaumatococcus danielli, Stevia rebaudiana, Synsepalum dulcificum, and Glycyrrhiza glabra and their respective sweetening constituent. VJG

4 U 199
Health laws and regulations - Australia.
World Health Organization
International Digest of Health Legislation **23** (3) 13-31 (1972) [En] [Geneva, Switzerland]

A selection of Australian health laws and regulation is presented including the following which relate to food hygiene. South Australia - amendments to the Food and Drugs Regulations 1962, made under the Food and Drugs Act, 1908-1967 (12 Feb. 1970) (prescribe that the label of any food containing cyclamate as permitted under the regulations must include the words 'take on medical advice only' and also every advertisement relating to such foods); amendments (23 April 1970) (dealing with toys in food packages, with canned meat paste, and with provisions relating to cream including bacteriological standards, and adding a new regulation relating to liquid egg); amendments (30 July 1970) (new regulation dealing with low calorie foods, new provisions dealing with dried milks); amendments (17 Dec. 1970) (relate to food additives); amendments (5 Aug. 1971) (relate to packaged meat); Tasmania - An Act (No. 28 of 1969) makes provision with respect to labelling of packages containing margarine and prohibits the sale of cooking margarine or butter to which any prohibited colouring substances or flavouring substance have been added (15 Dec. 1969). VJG

4 U 200
Health laws and regulations - Costa Rica.
World Health Organization
International Digest of Health Legislation **23** (11) 61-66 (1972) [En] [Geneva, Switzerland]

A selection of Costa Rican health laws and regulations is presented including the following which relate to food hygiene: Decree No. 3 of 20 Feb. 1970 prohibits the importation, production or manufacture of cyclamic acid and its salts, unless the provisions of Decree No. 14 of 19 Dec. 1966 have been satisfied; Decree No. 1478-SPPS of 5 Feb. 1971 lists synthetic and natural colours which are permitted in foodstuffs provided that their specifications conform to the FAO/WHO specifications for identity and purity of food additives. VJG

4 U 201
Health laws and regulations - Netherlands.
World Health Organization
International Digest of Health Legislation **23** (1) 84-111 (1972) [En] [Geneva, Switzerland]

A selection of Dutch health laws and regulations is presented including the following which relates to food hygiene: Decree of 9 June 1970 (Stb. 324) to amed the General Decree (commodities law) (relates to artificial sweeteners). VJG

4 U 207
Determination of cyclamate.
Nordic Committee on Food Analysis
Nordic Standard **42**: 2pp. (1972) [En & Sv]

The method is based on the reaction of cyclamates with nitrite to form sulphate and precipitation of the sulphate with $BaCl_2$, and is applicable within the range 10 mg. (min.) to 300 mg (max.). A portion estimated to contain 100 mg cyclamate is taken for analysis. With liquid foods, a portion diluted with water is boiled for 1-3 min, cooled to 60-70°C, admixed with $BaCl_2$ and HCl and left overnight. Any precipitate formed is filtered off, the clear solution mixed with $NaNO_2$ solution, heated for 2 h in a boiling water bath and allowed to stand overnight. The precipitate is filtered off, washed, dried, ignited at 550°C and weighed. With solid foods, a suspension is prepared and centrifuged, the clarified supernatant decanted and the sediment washed, re-centrifuged and decanted. The combined liquids are then treated as for fluid material. ELC

4 U 254
Jams, marmelade, jellies, fruit preserves and povidle.
Israel. Standards Institution
Israeli Standard **S.I. 34**, 8pp. (1972) [En] [Tel Aviv, Israel]

This in an English translation of the standard, originally published in Hebrew, which came into force in July 1972, replacing the earlier version of Jan. 1967. It deals with the products listed in the

e obtained by cooking fruits with or without
ition of sweetening ingredients. Products
ered are defined. Requirements are specified for
following: packaging (e.g. steel sheet cans, glass
); ingredients (fruit, sweetening ingredients,
itives); and the finished product (general
uirements, fruit content, product identification,
actometric value, filling, metal content,
servative content). Methods are described for
ntifying fruit and for determining refractometric
ue, % fill of containers, metal content, and
servative content. JA

238
racterization of the sweet-tasting protein from
scoreophyllum cumminsii (Stapf) diels.
l, H. van der; Loeve, K.
BS Letters **29** (2) 181-184 (1973) [13 ref. En]
ilever Res., Vlaardingen, The Netherlands]
A comparison of protein from Dioscoreophyllum
minsii with the only other known sweet-tasting
tein "thaumatin" (from the fruit of
umatococcus danielli) was made. Amino acid
nposition was similar with both proteins lacking
idine and free-SH groups, both proteins were
c, had isoelectric points of 9.03 and approx. 12
protein from D. cumminsii and thaumatin
pectively, had mol. wt. of 11 500 ± 1000 and 20
± 600 respectively, a sweetness intensity of 8.4 ×
and 1 × 10^5 respectively, and lost sweetness at
and 55°, 65 and 75° and 55 and 65° at pH 3.2,
and 7.2 respectively. The instability on heating
the loss of sweetness at low pH would restrict
use of these proteins as sweetners. PG

265
LC method for determination of saccharin,
lamates and dulcin in foods.]
nnschichtchromatographisches Verfahren zum
chweis von Saccharin, Cyclamat und Dulcin in
ensmitteln.
ller, B.; Ludwig, J.
teilungsblatt der GDCh-Fachgruppe
ensmittelchemie und Gerichtliche Chemie **26**
3-5 (1972) [3 ref. De] [Chem.
ersuchungsamt, 58 Hagen, Pappelstrasse 1,
eral Republic of Germany]

132
dern encyclopaedia of food hygiene. Vol. IV.
d poisoning.] Encyclopedie moderne de
giene alimentaire. Tome IV. Les intoxications
entaires. [Book]
erer, J.
pp. (1970, publ. 1971) [Fr]
he following aspects are dealt with: toxins of
erial origin; toxic components in plant foods;
amination of foods by radioactive elements
as ^{90}Sr, ^{137}Cs and ^{131}I; toxic components in
and related products; food additives; colorants;
amination of foods with metallic salts; pesticide
dues; and antibiotic residues. AA

5 H 740
Determination of cyclamate in soft drinks by reaction with nitrous acid. Gas-liquid chromatographic determination of cyclohexene and of cyclohexyl nitrite.
Dalziel, J. A. W.; Johnson, R. M.; Shenton, A. J.
Analyst **97** (1158) 719-722 (1972) [3 ref. En] [Chelsea Coll., Univ. of London, Manresa Road, SW3, UK]

Gas-liquid chromatographic determination of cyclohexene and of cyclohexyl nitrite, formed by reaction of cyclamate with nitrous acid under moderate or strong nitrosating conditions, have been evaluated. The determination based on the formation of cyclohexene under moderate nitrosating conditions proved to be the most precise and sensitive. The application of this procedure to the determination of cyclamate in soft drinks (10 orange and 10 lemon drinks) gave recoveries of 98 to 101% at the 1 mg ml^{-1} level; reaction conditions were evaluated and compared with those used by previous workers. AS

5 J 722
Indigenous plants in Ghana with taste-modifying properties or sweetening principles.
Adansi, M. A.
Ghana Journal of Agricultural Science **3** (2) 207-210 (1970) [6 ref. En, fr] [Plant Introduction & Exploration Section, Crops Res. Inst., Bunso, via Bosuso, Ghana]

The restriction in the USA on the use of the artificial sweetener, cyclamate, highlights the commercial potential of some indigenous plants known to have taste-modifying properties or sweetening principles. Synsepalum dulcificum (Schum & Thonn.) Daniell is already cultivated in Ghana and Thaumatoccus danielli Benth. and Dioscoreophyllum cumminsii Diels have possibilities as export crops. Brief data on habitat, availability of fruits and the unique properties of these 3 plants are presented. AS

5 L 402
[Blending of sugars and utilization.] [Lecture]
Watanabe, H.
Journal of the Starch Technological Research Society of Japan [Denpunto Gijutsu Kenkyu Kaiho] No. 39, 39-54 (1970) [Ja] [Kammi Shokuryohin Kenkyusho (Res. Inst. for Sweet Foods), Taito-ku, Tokyo, Japan]

Sucrose, glucose, isomerized sugar (from glucose to fructose), starch hydrolysate, sorbitol, and xylose were used for blending. Data are given in 28 tables. Not only sweetness but also good taste is [illegible] SKa

5 T 229
[Safety of food additives.] [Review]
Aiso, K.
Journal of the Food Hygienic Society of Japan [Shokuhin Eiseigaku Zasshi] **12** (4) 282-286 (1971) [19 ref. Ja] [Chiba Univ., Yayoicho, Chiba-shi, Japan]

Toxicological studies with chemical food preservatives, toxicity of food additives, evaluation standard for the long term toxicity test, terms such as maximum no effect level and acceptable daily intake, safety evaluation of food preservatives with respect to intake quantity, and the relationship between the food industry and the food additives safety problem are discussed. TM

5 T 231
Protein discovery - monellin - aids search for new sweetener substitute.
Morris, J. A.
Candy and Snack Industry **137** (8) 18, 22, 24 (1972) [4 ref. En]

The wide variety of chemical structures which give rise to sweet taste is illustrated. Properties of monellin and possible applications are considered. VJG

5 T 245
[Organoleptic problems with sugar substitutes.]
Organoleptische Probleme beim Austausch von Zucker durch Zuckerersatzstoffe in Lebensmitteln. [Review]
Eijk, A. van
Gordian **73** (2) 44, 46-49 (1973) [41 ref. De] [Destilaciones Garcia de la Fuente SA, Granada, Spain]

5 T 259
Artificial sweeteners.
Ajinomoto Co. Inc.
British Patent 1 297 741 (1972) [En]

The unpleasant aftertaste of saccharin-containing sweet compositions is reduced by incorporation of tryptophan. IFT

5 U 332
Health laws and regulations - Australia (New South Wales).
World Health Organization
International Digest of Health Legislation **23** (1) 3-12 (1972) [En] [Geneva, Switzerland]

A selection of New South Wales health laws and regulations is presented including the following which relate to food hygiene: New South Wales - Regulations under the Pure Food Act, 1908, are further amended to make provisions for labelling of foodstuffs (dated 24 Dec., 1968), and low calorie food, prawns and shrimps (dated 18 April, 1969); an Act (No. 18 of 1969) to amend the Meat Industry Act of 1965 in certain particulars notably relating to poultry processing (17 Dec., 1969); Amendments to the Food and Drug Regulations, 1964, made under the Health Act 1937-1968 (13 March, 1970) (the most significant amendments relating to poisonous metals in foods, antioxidants and modifying agents and vitamins and minerals); Amendments to the Dairy Produce Regulations of 1936, made under the Dairy Produce Acts, 1920 to 1963 (26 March, 1970) (establish standards for various categories of milk and milk products or ingredients used in their preparation); Amendments to the Food and Drug Regulations, 1964, made under the Health Act 1937-1968 (9 Nov., 1970) (relating to edible fats and oils and margarine); Amendments to the Food and Drug Regulations, 1964, introducing a new version of Regulation 13 which relates to artificial sweetening substances (3 Dec., 1970). VJG

5 U 334
Health laws and regulations - Norway.
World Health Organization
International Digest of Health Legislation **23** (2) 299-317 (1972) [En] [Geneva, Switzerland]

A selection of Norwegian health laws and regulations is presented including the following which relate to food hygiene: Amendments of 22 Dec., 1969 to the General Regulations of 3 May, 1935 on the manufacture of and trade in foods, etc. (the definition of 'additives' given in Section 7 of the General Regulations is replaced; the following shall not be considered additives: water, common salt, sugars, ethyl alcohol, vinegar, natural spices, substances which are added during smoking with wood smoke, vitamins and mineral salts); Instructions of 4 March, 1970 of the Director-General of Health Services concerning the use of artificial sweeteners (cyclamates) (cyclamates are deleted from groups IVb, VIb and VIIIb of the List of permitted additives, but they can be added to foodstuffs, condiments and stimulants for diabetics. Sweetening products containing cyclamates may be marketed as general commercial goods but must bear a label indicating their content and stating that the product should only be used by those persons who health reasons need to restrict their sugar and/or calorie intake); and Regulations of 25 June, 1971 concerning compulsory notification of the composition of food additives. VJG

5 U 338
Health laws and regulations - Ireland.
World Health Organization
International Digest of Health Legislation **23** (3) 545-551 (1972) [En] [Geneva, Switzerland]

A selection of Irish health laws and regulations is presented including the following which relate to food hygiene: the Health (Cyclamate in Food) Regulations, 1970 (12 March, 1970) (state that a person may not manufacture, prepare, import, store, distribute or expose for sale cyclamate for use in food intended for human consumption or a food containing cyclamate intended for sale for human consumption, unless the container is labelled in the approved manner to show that the food contains cyclamate and should be consumed only on medical advice and that the cyclamate is intended for use in food for consumption on medical advice; and the Health (Sampling of Food) Regulations, 1970 (dated 12 March, 1970). VJG

J 341
alth laws and regulations - Mexico.
orld Health Organization
ernational Digest of Health Legislation **23** (2) 4-224 (1972) [En] [Geneva, Switzerland]
A selection of Mexican health laws and ulations is presented including the following ich relate to food hygiene: Instruction of 25 rch, 1969 on the sanitary control of poultry ended for human consumption (including general visions, inspection, evisceration, storage and alties); and Order of 11 Dec., 1969 to prohibit use of salts of cyclamic acid as food additives in dstuffs and beverages, in so far as they entail a ious danger to health. VJG

L 456
w-D.E. corn starch hydrolysates.
urray, D. G.; Luft, L. R.
od Technology **27** (3) 32-33, 36, 38, 40 (1973) ref. En] [Amoco Foods Co., Div. of Standard l Co. of Indiana, 910 S. Michigan Av., Chicago, nois 60605, USA]
Low-dextrose equivalent corn starch hydrolysates ve multifunctional properties useful in food mulation. This article describes their properties d their use in such applications as dry, low-isture, intermediate-moisture, frozen, and ricated foods. IFT

T 271
eratogenic effect of cyclamate.] Teratogene irkung des Cyclamat.
olf, A.; Jelinek, J.; Faltysova, J.
rnährungsforschung **16** (4) 537-540 (1971) [18 f. De] [Lehrstuhl für Ernährungshygiene, ygienisch-med. Fak., Karls-Univ. Prague, echoslovakia]
Using the standard method with hen's embryo, e FLD_{50} (foetal medium lethal dose) was termined with 240 µg sodium cyclamate/egg (P = 01). The tetratogenic effect was in the range 60-0 µg/egg, but the significance could not be rified statistically due to the high cytotoxicity. he standard method requires modification by a ecial inoculation technique or by testing at a later ge in the development. IN

T 272
tificial sweeteners.
mberland Packing Corp.
itish Patent 1 299 135 (1972) [En]
Saccharin composition having no bitter aftertaste ploy mixtures of γ-gluconolactone, sodium or tassium gluconate, and potassium bitartrate.
T

6 T 273
Honey-malt flavouring.
Mitchell, W. A.; Stahl, H. D. (General Foods Corp.)
United States Patent 3 711 302 (1973) [En]
Low calorie food flavouring and texture enhancing material is prepared by drum drying on aqueous solution of low jelly grade pectin and artificial sweeteners. IFT

6 T 296
New sweetening agents: N'-formyl- and N'-acetylkynurenine.
Finley, J. W.; Friedman, M.
Journal of Agricultural and Food Chemistry **21** (1) 33-34 (1973) [10 ref. En] [W. Regional Res. Lab., USDA, Berkeley, California 94710, USA]
N'-Formyl- and N'-acetylkynurenine are approx. 35 times sweeter than sucrose. The kynurenine derivatives elicit a sweet taste sensation immediately on contact with the taste buds. The sweetness of the acetyl derivative is linearly comparable to sucrose in concn. up to 2.5 mg/ml. A sweetness comparison of sucrose and the formyl analogue is linear to 1.6 mg/ml. An off-flavour at higher levels of N'-formylkynurenine may account for the lack of comparability to N'-acetylkynurenine and sucrose at higher concn. A new synthesis for DL-kynurenine is described. AS

7 A 320
[Determination of saccharin sodium in food by gas chromatography.]
Kuroda, H.; Hirose, H.
Journal of the Food Hygienic Society of Japan [Shokuhin Eiseigaku Zasshi] **12** (4) 322-325 (1971) [4 ref. Ja, en] [Kagawa Prefecture Public Health Lab., 4-15, Ban-cho 5, Takamatsu-shi, Japan]
This method is based on the fact that saccharin sodium is converted to a thiophenol derivative by the reaction with 1 ml HCl and 2 g Zn at 90°C. The derivative is extracted with 3 ml methyl isobutyl ketone containing 0.01 w/v % pyrene as internal standard and then injected into a gas chromatograph. Chromosorb G containing silicone DC-11 (2%) is suitable as the column for thiophenol derivative or pyrene. This method was applied to fruit juice and canned fruit, into which 500 ppm of saccharin was added. The min. limit of detection was approx. 1 µg as saccharin. TM

7 A 344
Sensory perception of sweetness.
Pangborn, R. M.
Abstracts of Papers, American Chemical Society **165**, AGFD 5 (1973) [En] [Food Sci. & Tech., Univ. of California, Davis, 95616, USA]
The problems of measuring sweetness are considered with reference to the influence of solution temp., pH, viscosity and the presence of other substances on sweetness, and the variations amongst individuals in the perception of sweetness AA

7 A 351
Biophysical basis of sweetness.
Beidler, L. M.
Abstracts of Papers, American Chemical Society 165, AGFD 4 (1973) [En] [Dept. of Biol. Sci., St. Univ., Tallahassee, Florida 32306, USA]
There exist many different types of receptor sites to which sweet stimuli may bind. Thus, the stimulus-response function differs from one sweetener to another. Likewise, sweetness of mixtures may be either greater or lesser than that predicted from the algebraic sum of the individual sweetness of the components. Taste modification may occur by the processes of competitive inhibition, binding constant modification and alteration of electrical charge of the taste receptor membrane. Relative effectiveness of ammoniated glycyrrhizin, sodium saccharin, sugars, sodium cyclamate, amino acids, L-aspartyl-L-phenylalanine methyl ester, and stevioside are discussed. AS

7 D 345
Sweetener economics.
Walter, B. J.
Abstracts of Papers, American Chemical Society 165, AGFD 2 (1973) [En] [Economic Res. Service, USDA, Washington, DC 20250, USA]
The sweetener market in the USA is discussed with reference to the 5 principal types of sweetener in commercial use, i.e. beet and cane sugar (sucrose), corn or starch sweeteners (corn syrup and dextrose), noncaloric sweeteners (primarily saccharin), maple sweeteners, and honey. The importance of the development of high fructose (levulose) corn sweeteners to both corn and sugar marketing is mentioned. AA

7 G 373
Recall of food products. [Symposium]
Khan, P. (Chairman)
Food, Drug and Cosmetic Law Journal 27 (11) 660-735 (1972) [En]
Papers presented at the symposium on the Recall of Food Products held at Minneapolis, Minnesota on May 21-25, 1972, include the following: Murphy's Law and consumer protection, by P. Khan (pp. 660-661); Recalls - definition and exposition, by S. D. Fine (pp. 662-667); Voluntary recalls or delegated seizures: the legal considerations, by E. I. Lambert (pp. 668-672); Insurance for product withdrawal, by J. J. Kircher (pp. 673-679); Production records: tracing and recording of ingredients, by A. Thomas (pp. 680-688); Distribution of processed foods, by J. Scala (pp. 689-695); Recalls international, by P. M. Karl (pp. 696-701); The removal and disposal of suspect product, by C. Livingston (pp. 702-708); and Recall of food products; emergency standby procedures at the Home Office, by P. Khan & D. C. Healton (pp. 709-735). VJG

7 L 530
Corn syrup solids.
Glabe, E. F. (Food Technology Inc.)
United States Patent 3 718 4845 (1973) [En]
A high fructose corn syrup is slurried with ungelatinized starch and heated to a temp. of 15-30°C below the gelatinization temp. to condition the starch, thus limiting gelatinization on subsequent drying in a thin film on a heated surface. IFT

7 L 572
Sweetness and sensory properties of dextrose-fructose-sucrose blends.
Brooks, G. A.; Warnecke, M. O.; Long, J. E.
Abstracts of Papers, American Chemical Society 165, AGFD 13 (1973) [En] [CPC International, Moffett Tech. Center, Argo, Illinois 60501, USA]
Syrups that contain 40-50% levulose and 50-60% dextrose are now being introduced to the USA food industry. These are made by the enzymatic isomerization of dextrose. The starting dextrose may be from crystalline dextrose or from the dextrose present in high dextrose equivalent corn syrup. Dextrose-levulose syrups alone and with added sucrose were compared to sucrose and medium invert for sweetness. Most of the tests described in this paper were performed on a dextrose-levulose syrup (55% dextrose-45 % levulose) made from crystalline dextrose. Test systems were distilled water (10-25% sweetener solids) and acidified, carbonated water (10-15% sweetener solids). The results showed a synergistic sweetness effect when sucrose, dextrose and levulose are present in the same solution. These and other results are discussed. AS

7 L 573
Corn sweetener industry.
Commerford, J. D.
Abstracts of Papers, American Chemical Society 165, AGFD 12 (1973) [En] [1001 Connecticut Ave., NW Washington, DC 20036, USA]
In the USA, 11 of the 12 companies engaged in corn wet milling produce corn sweeteners. Total domestic production of sweetener products exceeds 4 billion pounds. Worldwide production, including sweeteners made from other starch sources, is about 7 billion pounds. Corn syrup (glucose syrup) accounts for two-thirds of the total. Corn syrup is made by the conversion of starch by means of acid, enzyme, acid-enzyme or dual enzyme processes. A variety of types are manufactured, each designed to meet the demands of specific segments of the food processing industry. Syrups having a particular composition of saccharides can be prepared by selection of specific processes and/or conditions. For example, syrups low in dextrose and high in maltose are manufactured for the hard candy industry. The other major product, dextrose, is made by further conversion and refining. Crystalline anhydrous dextrose or dextrose hydrate is used in many food products where the processor takes advantage of its various functional properties such as sweetness, flavour, fermentability, stability and osmotic pressure. AS

74
fructose corn syrup.
on, J. M.; Wardrip, E. K.
racts of Papers, American Chemical Society
AGFD 20 (1973) [En] [Clinton Corn
ssing Co., Clinton, Iowa 52732, USA]
e use of starch as the raw material for the
uction of nutritive saccharides is briefly
wed. A detailed summarization of the methods
rocesses proposed for producing starch
ed syrups containing fructose is presented.
cular emphasis is placed on patents and
cations issued in the past 5 yr. The objectives
veral research programmes in progress is
narized. The syrups being produced
nercially, as well as proposed additional
s, their composition, properties and uses are
ssed. AS

77
e syrup and honey.
e, J. W., Jr.; Underwood, J. C.
racts of Papers, American Chemical Society
AGFD 21 (1973) [En] [Agric. Res. Service,
A, 600 East Mermaid Lane, Philadelphia,
sylvania 19118, USA]
aple syrup and honey are essentially unrefined
tening agents. In recent years the food industry
onsidered them to be flavouring materials
r than sweeteners. Each has had major
rtance as a sweetening material in times past,
ach has been extensively studied in the
cultural Research Service. This paper reviews
roduction, properties, uses, and supply-
nd situation for these 2 natural sweeteners.

19
icial sweeteners.
miya, T.; Ojima, T.; Yamaguchi, S.; Ito, M.
omoto Co. Inc.)
ed States Patent 3 717 477 (1973) [En]
e sweetening potency and taste of saccharin
m are improved by addition of even small
nts of D-tryptophan. IFT

44
etic sweeteners: past, present and future.
K. M.
acts of Papers, American Chemical Society
AGFD 22 (1973) [En] [Abbott Lab., N.
go, Illinois 60064, USA]

7 T 356
Some aspects of a three commodity sweetener system.
Cantor, S. M.; Shaffer, G. E.
Abstracts of Papers, American Chemical Society **165**, AGFD 3 (1973) [En] [Sidney M. Cantor Associates Inc., Haverford, Pennsylvania 19041, USA]

The nutritive sweetener system of the USA is based largely on sugar cane and sugar beets. Dependence on products derived from corn starch hydrolysates is relatively small by comparison. Over the past few decades, however, influences have been developing which may change this balance to place a greater dependence on corn. These influences include: the secular trend of downward pressure on carbohydrate consumption, a proliferating product array from starch hydrolysate technology, the relative cost of sweeteners, the separation of the property of sweetness from other functional properties of sugars, the development of new non-nutritive sweeteners, the continuing shift of food preparation from home kitchens to commercial factories, problems, largely tactical, associated with insuring the supply of raw sucrose, the increasing understanding of the metabolic pathways of sugars, and many others. This paper will examine some possible consequences of shifting emphasis in this multivariate system which may result in significant changes in nutritive sweetener sources. AS

7 T 357
Sweeteners: new challenges and concepts.
Inglett, G. E.
Abstracts of Papers, American Chemical Society **165**, AGFD 1 (1973) [En] [N. Reg. Res. Lab., ARS, USDA, Peoria, Illinois 61604, USA]

The sweetener industry is discussed with reference to: health value and safety of synthetic sweeteners; sweeter syrups from corn; the need for a superior synthetic sweetener; and the need for a better scientific understanding of sweetness. The concept that a sweet 'probe' portion of some macromolecules is responsible for sweet taste is discussed with reference to miracle fruit (Synsepalum dulcificum), serendipity berry (Dioscoreophyllum cumminsii), and katemfe (Thaumatococcus daniellii). AA

7 T 358
Aspartic acid based sweeteners.
Mazur, R. H.; Beck, C. I.
Abstracts of Papers, American Chemical Society **165**, AGFD 31 (1973) [En] [G. D. Searle & Co., Skokie, Illinois 60076, USA]

The discovery of the sweet taste of aspartylphenylalanine methyl ester (i) resulted in an intensive study of structure-activity relationships. Correlation enabling the prediction of new sweet compounds in this series are discussed. Methods for determining the character, sweetness, and acceptable uses for (i) and other sweet substances, are outlined. AA

7 T 359
Structural aspects of glycosidic sweeteners containing (1→2)-linked saccharides.
Inglett, G. E.; Hodge, J. E.
Abstracts of Papers, American Chemical Society 165, AGFD 35 (1973) [En] [N. Reg. Res. Lab., ARS, USDA, Peoria, Illinois 61604, USA]

Stevioside and glycyrrhizin are naturally occurring sweeteners that are intensely sweet. Stevioside is found in the leaves of Stevia rebaudiana Bertoni and is 300 times as sweet as sucrose. Glycyrrhizin is found in licorice roots (Glycyrrhiza glabra L.) and is 50 times as sweet as sucrose. Intense sweeteners are also obtained from the citrus flavonoids, neohesperidin and naringin, by hydrogenation to give dihydrochalcones. All of these intensely sweet substances have carbohydrate moieties containing (1~2)-linked disaccharides. The structural relationship of these sweeteners to their sweet-invoking properties is discussed. AS

7 T 360
Glycyrrhizin.
Storm, H., Jr.
Abstracts of Papers, American Chemical Society 165, AGFD 34 (1973) [En] [MacAndrews & Forbes Co., Third Street & Jefferson Ave., Camden, New Jersey 08104, USA]

Glycyrrhizin is the characteristic sweet tasting components of licorice root (Glycyrrhiza glabra L.). The plant grows wild throughout the Middle East and is harvested in commercial quantities. The dehydrated aqueous extract of the root is the commercial product which contains tha Ca and Mg salts of glycyrrhizic acid (25%), sugars, starches and gums. This extract is used primarily to flavour and sweeten tobacco products and confections. A crude, ammonium glycyrrhizinate (AG) is prepared from the extract by precipitation with a mineral acid. AG is used by the food, beverage, and drug industries as a sweetener, flavour, and flavour potentiator. Further treatment yields a white, crystalline mono-ammonium glycyrrhizinate (MAG) which is used in applications where low pH and colour rule out AG. The sweet taste of glycyrrhizin is detectable at one-fiftieth of the threshold taste level of sucrose. Glycyrrhizic acid is a plant glycoside which on hydrolysis yields two moles of glucuronic acid and one mole of glycyrrhetinic acid, a triterpene related to oleanolic acid. AS

7 T 361
Katemfe, Serendipity berry and miracle fruit.
Wel, H. van der
Abstracts of Papers, American Chemical Society 165, AGFD 33 (1973) [En] [Unilever Res. Lab., Olivier van Noortlaan 120, Vlaardingen, The Netherlands]

The tropical African fruits Katemfe (Thaumatococcus daniellii) and Serendipity berry (Dioscoreophyllum cumminsii) contain substances with a very sweet taste. Two sweet-tasting principles, thaumatin I and II, have been isolated from Katemfe and one, monellin, from Serendipity berry, by means of aqueous extraction followed by ultrafiltration, gel filtration and ion-exchange chromatography. The sweet principles show many similarities; they are basic proteins, have a sweetness intensity on a molar basis which is about 10^5 times that of sucrose, do not contain histidine and free SH groups and show comparable conformational changes on heating and changing the pH. The mol. wt. of thaumatin I and II and monellin are 21 000, 20 400 and 11 500 respectively. The instability to heating and the complete loss of sweetness at room temp. at a pH below 2 restrict the use of these proteins as a sweetener. Another basic protein, miraculin, isolated from the miracle fruit (Synsepalum dulcificum) is tasteless but has the peculiar property of changing a sour taste into a sweet one. It is a glycoprotein with a mol. wt. of 42 000. Like the sweet-tasting proteins, it is heat-labile and cannot stand a low pH. This and the long-lasting sweetness-inducing effect will probably restrict the application of miraculin. AS

7 T 362
Manufacturers and suppliers; products and brand names; applications and conditions of use.
Anon.
Food Manufacture March, Ingredient Survey, 15-16, 18-19, 21-23, 25-27, 30-31, 33-36, 38-39, 41-42, 44 (1973) [En]

Tables list manufacturers and suppliers of food additives in alphabetical order under type of ingredient (acidulants, antioxidants, cereal products, colours, curing compounds, dietary supplements, etc.). Brand names, composition and applications are also listed. Addresses of manufacturers and suppliers are appended. [See FSTA (1972) 4 7T401 for previous tables.] JA

7 T 363
Dihydrochalcone sweeteners.
Horowitz, R. M.; Gentili, B.
Abstracts of Papers, American Chemical Society 165, AGFD 32 (1973) [En] [USDA, Agric. Res. Service, Fruit & Vegetable Chem. Lab., Pasadena, California 91106, USA]

Dihydrochalcone sweeteners were first prepared in the early 1960s as part of a study of the effects of structural modifications on the taste of bitter citrus flavanones. From a practical point of view the most interesting of these sweeteners are naringin dihydrochalcone (derived from naringin), neohesperidin dihydrochalcone (from neohesperidin or the conversion of naringin) and hesperetin dihydrochalcone 4'-O-glucoside (from hesperidin by reduction and partial hydrolysis). Many A- and B-ring variants of these compounds have been prepared with the aim of clarifying structure-activity relations and obtaining useful new derivatives. Recent developments in this field are discussed, including the application of a new method for detecting dihydrochalcones. AS

65
ign additives as risk factors.]
dstoffzusätze als Risikofaktoren.
Rat, L. de
hrungsforschung **16** (4) 481-492 (1971) [35 De] [Generalsekretariat der Internationalen mission der Landwirtschafts- & Lebensmittel- Paris, France]
e sweetening effect, utilization, toxicity and nogenic effect of cyclamate are described; no rm test results on the latter effect have been ved. The use of the following substitute ening agents is discussed: saccharin, phan, various dipeptides, peryllartin, side, Nigeria berries, xylite, glycorrhicin, gin, neohesperidin, and tetrazole compounds. nd toxicological properties of benzoic acid are lescribed. IN

70
arin and cyclamates toxicology and chemistry.
, P. H.
acts of Papers, American Chemical Society
AGFD 24 (1973) [En] [WARF Inst. Inc., ox 2599, Madison, Wisconsin 53701, USA]
sting of cyclamates and saccharin is discussed, emphasis on methods of testing and results ned, with regard to future work on food ves. AS

71
ent status on saccharin.
y, F. B.
acts of Papers, American Chemical Society
AGFD 23 (1973) [En] [Monsanto Co., 800 ndbergh Boulevard, St. Louis, Missouri 6, USA]
e types of impurities to be expected in arin are outlined and analytical work to lish whether any potentially toxic substances be present in saccharin is discussed. The most t regulatory actions on the use of saccharin in and drugs are summarized. AA

74
r substitutes.] Zuckeraustauschstoffe.
fe, G.; Gutermann, H.; Müller, H. (Maizena H)
an Federal Republic Patent Application
428 (1973) [De]
ctite or 4--β-D-galactopyranosyl-D-sorbitol is as a sweetener for diabetics and slimmers. It is en down into D-galactose and D-sorbitol by se more slowly than conventional lactose and se, remains unaffected by Rhizopus mylase, α-amylase and pancreatin, and is y soluble in water. Lactite may be used in crystal form or in the form of lactose tion products having a high content of lactite. Co

8 A 374
[Application of subjective gustometry and olfactometry to evaluation of the relative sweetness of sugars and sweeteners.] Die Anwendung der subjektiven Gustometrie und Olfaktometrie, dargestellt am Beispiel der relativen Süssigkeit von Zuckern und Süsstoffen.
Herrmann, J.
Lebensmittel-Industrie **20** (1) 13-17 (1973) [12 ref. De, en, ru] [Sektion Nahrungsgüterwirtschaft und Lebensmitteltech., Bereich Mikrobiologie und Biochem. der Humboldt-Univ. Berlin (GDR)]
[See also FSTA (1973) **5** 6A283.]

8 C 240
[New methods for evaluation and interpretation of sensory qualities of foodstuffs and for forecasting changes. VI. Calculation of the "relative sweetness" of sugar mixtures with and without addition of acid.] Neue Methoden der Be- und Auswertung sensorischer Eigenschaften von Lebensmitteln und der Berechnung ihrer Veränderungen. 6. Die Berechnung der "relativen Süssigkeit" von Zuckermischungen mit und ohne Säurezugabe.
Herrmann, J.
Nahrung **17** (1) 11-22 (1973) [6 ref. De, en, ru] [Sektion Nahrungsgüterwirtschaft und Lebensmitteltech. Biochemie und Reaktionskinetik der Lebensmittel, Humboldt-Univ. Berlin (GDR)]
Using previously derived equations, a calculation is given for an example taken from the literature of the "relative sweetness" of glucose and fructose concn. and of their mixtures (with and without addition of acid). These equations permitted a forecast of the sweetness of sugar mixtures with good approximation. It is concluded that the synergistic interaction between sugars must not be interpreted as a fortification, but simply as an additive effect, e.g. the addition of a given amount of fructose to glucose solutions has the same effect as the addition of a glucose concn. of the same sweetness. The addition of a given amount of acid to glucose and fructose solutions or to their mixtures seems to act as if the same quantity of sugar is always compensated. The calculations might be of value in solving the important problem of sensory, synergistic and compensating interactions between substances [See also FSTA (1973) **5** 1 A45.] IN

8 L 646
Handbook of sugars for processors, chemists and technologists. [Book]
Junk, W. R.; Pancoast, H. M.
xiii + 327pp. ISBN 0 87055 133 7 (1973) [many ref. En] Westport, Connecticut, USA, AVI Publishing Co. Inc. Price $20.50 (USA) $21.50 (Foreign)
A considerable amount of information of value to food manufacturers is given, on physical properties of sucrose and corn sugars, under the chapter headings: Sucrose (cane or beet sugars) (pp. 1-6, 16 ref.); Granulated sugar (pp. 7-18, 7 ref.); Liquid sugars (pp. 19-23, 2 ref.); Properties

of sucrose liquid sugars (pp. 24-49, 11 ref.); Properties of invert and sucrose-invert liquids (pp. 50-66, 8 ref.); Specialty sugar products (pp. 67-71); Bulk handling of sugar (pp. 72-88, 2 ref.); Corn milling industry (pp. 89-94, 18 ref.); Manufacture of corn syrups and sugars (pp. 95-104, 18 ref.); Properties of corn syrups (pp. 105-156, 31 ref.); Properties of corn sugars (pp. 157-169, 11 ref.); [Continued in following abstr.] JN

8 L 647
Handbook of sugars for processors, chemists and technologists. [Book]
Junk, W. R.; Pancoast, H. M.
xiii+327pp. ISBN 0 87055 133 7 (1973) [many ref. En]

[Continued from preceding abstr.] Handling and storage methods (pp. 170-180, 2 ref.); Analytical methods (pp. 181-187, 9 ref.); and Blends of sucrose, corn syrup and dextrose (pp. 188-224, 5 ref.). A series of appendices give: Canners' microbiological standards for sugar (with test procedures) (pp. 225-229); Standards and test procedures for 'bottler's' granulated and liquid sugar (pp. 230-234); Official methods of analysis of International Commission for Uniform Methods of Sugar Analysis (pp. 235-255); Standard analytical methods of the member companies of the Corn Refiners Association Inc. for corn syrup analysis (pp. 256-308); Standard analytical methods of the member companies of the Corn Refiners Association Inc. for corn sugars (pp. 309-318); and Analytical methods for corn syrup solids (pp. 319-320). A 7-pp. subject index is provided. JN

8 M 1108
[Honey and molasses solids, new sweeteners for bread and biscuits.]
Anon.
Industrie Alimentari **12** (2) 74-76 (1973) [It]

The use of powdered honey and molasses solids as sweeteners in baking is discussed. Powdered honey contains 75.0% honey solids, 23.5% starch and 1.5% water; it can be used in amounts of 10% to make honey biscuits. It is sold commercially as a powder, in granules or as a very fine powder. Powdered molasses contains 60.0% molasses solids, 37.0% starch and 3.0% water. It is sold in granular or sheet form and can be used in baked products especially bread. It gives the crust a good colour and can be used in amounts of 20-25%, with the addition of 0.1% Na_2CO_3 to neutralize its acidity; it can also be used in biscuits. LA

8 T 385
[Recent problems with artificial sweetening agents.] [Review]
Tanaka, H.
Up-to-Date Food Processing [Shokuhin Kaihatsu] **7** (8) 35-37 (1972) [4 ref. Ja] [Aichi Kyoiku Univ., Nagoya, Japan]

Topics covered include: dihydrochalcone derivatives such as naringin dihydrochalcone; neohesperidin dihydrochalcone; hesperidine glucoside dihydrohalcone; homohesperidine dihydrochalcone; 2′,4′,6′,3-tetrahydroxy-4-n-propoxydihydrochalcone 4′-β-neohesperidoside; and dipeptide derivatives such as Asp-Phe-OCH_3 and Asp-Met (-0)-OCH_3. SKa

8 T 386
[Colorimetric determination of cyclamate.]
Takeuchi, M.; Kashiwagi, H.; Washizuka, K.; Matsui, T.
Journal of Hygienic Chemistry [Eisei Kagaku] **18** (5) 324-328 (1972) [6 ref. Ja] [Fac. of Pharmaceutical Sci., Kinki Univ., 321 Komatzue, Higashiosaka City, Osaka, Japan]

A colorimetric method for the determination of cyclamate in foods, based on the reaction of cyclohexanol with vanillin-sulphuric acid reagent, was established. After separation of cyclamate from other components by means of dialysis, cyclamate was converted to cyclohexyl nitrite with nitrous acid and then to cyclohexanol with sulphamic acid. Cyclohexanol was extracted with ether. After the addition of water to the extract, the ether was evaporated by vigorous stirring using a mixer at room temp. The remaining water layer (containing the cyclohexanol) was cooled in an ice bath; vanillin-sulphuric acid reagent was added, and the mixture was warmed at 70°C for 20 min, to form a greenish product. The abosrbance of the resulting coloured solution was measured spectrophotometrically at 655 mμ. The recovery of sodium cyclamate added to foods was found to be 93.2-98.8%. HK

8 T 402
[Synthetic sweeteners and natural sweeteners. Future prospects.]
Dupaigne, P.
Fruits **28** (1) 51-64 (1973) [133 ref. Fr, de, en, es, ru] [IFAC, 6 rue du General Clergerie, 75116 Paris, France]

The controversy and problems concerning sweeteners are reviewed with reference to fructose, D-xylose, sorbitol, cyclamates, saccharin, dulcin, amino acids and dipeptides, dihydrochalcones, xylitol, perillaldehyde anti-oxine (perillartin), glycyrrhizin, stevioside, glycoproteins and plant proteins (miraculin, thaumatin, monellin, derived from Richardella dulcifera, Thaumatococcus danielli, Dioscoreophyllum cumminsii). RM

8 T 441
[Determination of cyclamate in foods.] Zur Bestimmung von Cyclamat in Lebensmitteln.
Groebel, W.; Wessels, A.
Deutsche Lebensmittel-Rundschau **68** (12) 393-397 (1972) [16 ref. De, en, fr] [Chem. Landesuntersuchungsamt, Münster, Federal Republic of Germany]

A gas chromatographic method for quantitative determination of cyclamates in foods (especially fruit conserves, fruit juices, wines and other beverages) is described. 100ml samples are evaporated to 30 ml in a rotary evaporator at 60°C;

of 12.5% H_2SO_4 and 1 ml internal standard
ution of 10.0 g methyl ethyl ketone in 100 ml
) are added, and the vol. made up to 100 ml.
shaking, a 1 ml sample is taken, 50 µl of
$)_2$ solution (4 g in 10 ml water) is added, the
on is heated for 2 h at 24°C and the
exene evolved is determined by headspace
Analysis of 20 fruit juice samples spiked with
mg calcium cyclamate showed that results
ighly reproducible; standard deviation was
, and relative standard deviation was 0.91.
iate levels determined in various fruit
ts were as follows (mg/100 ml): cherry juice
grapefruit juice 47.1, currant juice 40.0,
juice 36.0, passion fruit juice 138.0, pear
ves 104.9, peach conserves (whole fruit, 2
s) 223.7 and 177.3, peach conserves (slices)
and apricot conserves 226.8. AJDW

39
**se syrup - determination of dry matter-
tive index method.**
ational Organization for Standardization
ational Standard **ISO 1473-1973 (E)**, 13pp.
) [En]
s standard specifies a refractometric method
tn. of DM in glucose syrup or solid glucose
ed by acid hydrolysis. The method is based
ermination of the refractive index of an
ted sample or a solution containing a known
rtion of the product, at a specified temp.; DM
nen be calculated from a series of tables
ng refractive index as a function of
osition, conc. and temp. Instructions are given
pression of results and presentation of test
s, and an appendix gives the tables required
culation of results. AJDW

80
**sweetening power of fructose as related to
rature, concentration and substrate.]** Die
aft von Fructose in Abhängigkeit von
eratur, Konzentration und Substrat.
r, A.; Prochazka, E.; Gutschmidt, J.
smittel-Wissenschaft + Technologie **6** (2) 63-
973) [4 ref. De] [Bundesforschungsanstalt
bensmittelfrischhaltung, Inst. für Chemie und
Karlsruhe, Federal Republic of Germany]
ns water, tea (made from 7 g Darjeeling
water), lemon juice (170 ml concentrate/l.
and commercial grapefruit juice were used
strates to determine the sweetening power of
e in terms of sucrose. An experienced taste
was employed; different temp. (5, 25, 40 and
and concn. (3 and 5%, also 15% with the
were used. The results for tea and mains
were in keeping with earlier findings [See
i & Yamazaki (1953) Biochem. Z. 323, 525]
e sweetening power of fructose against
declined linearly with increasing temp.
approx. 140% at 5° to 80% at 60°C for a 5%
). With the juices, which were less temp.
lent, there was a max. sweetening power at
. 25°C, and the absolute sweetening power
s than in tea or water; possible causes are
ed. HBr

9 L 731
Sugarless confections.
Liebrand, J. T. (Pfizer Inc.)
United States Patent 3 738 845 (1973) [En]
Crystallization of sorbitol in the preparation of clear sorbitol hard candies is prevented by addition of an organic acid, such as citric acid, prior to completion of cooking. IFT

9 T 443
Handbook of food additives. [Book]
Furia, T. E. (Editor)
Second edition xi + 998pp. ISBN 0 87819 542 4 (1972) [many ref. En] Cleveland, Ohio 44128, USA, CRC Press. Price $39.50 [CIBA-GEIGY Corp., Ardsley, New York, USA]
This 2nd edition reflects important changes in the food industry since the 1st edition was published in 1968. In Part I, the subject is covered under the headings: Introduction, by T. D. Luckey (pp. 1-26, 96 ref.); Enzymes, by L. A. Underkofler (pp. 27-84, 201 ref.); Vitamins and amino acids, by B. Borenstein (pp. 85-114, 11 ref.); Antimicrobial food additives, by D. F. Chichester & F. W. Tanner, Jr. (pp. 115-184, 273 ref.); Antioxidants as food stabilizers, by B. N. Stuckey (pp. 185-223, 68 ref.); Acidulants in food processing, by W. H. Gardner (pp. 225-270, 467 ref.); Sequestrants in food, by T. E. Furia (pp. 271-294, 187 ref.); Gums, by R. E. Klose & M. Glicksman (pp. 295-350, 323 ref.); Starch in the food industry, by O. B. Wurzburg (pp. 361-395, 19 ref.); Surface active agents, by W. C. Griffin & M. J. Lynch (pp. 397-429, 58 ref.); Polyhydric alcohols, by W. C. Griffin & M. J. Lynch (pp. 431-455, 176 ref.); Natural and synthetic flavorings, by R. L. Swaine (pp. 457-512, 124 ref.); Flavor potentiators, by L. B. Sjöström (pp. 513-521, 13 ref.); Non-nutritive sweeteners, by A. Salant (pp. 523-585, 624 ref.); Color additives in food, by J. Noonan (pp. 587-615, 17 ref.); Phosphates in food processing, by R. H. Ellinger (pp. 617-780, 1005 ref.). In Part II, the regulatory status of approx. 2000 direct food additives is tabulated, listing alternative names, FEMA (Flavor & Extract Manufacturers' Association) No., FDA Regulation and Limitations. A detailed 19-pp. subject index is included. JN

9 T 444
Sweetening agents.
Tsuyama, N.; Kurimoto, M.; Sugimoto, K.; Mitsuhashi, M. (Hayashibara Co.)
United States Patent 3 728 132 (1973) [En]
Sweetening agents for foods and beverages are prepared by subjecting mixtures of starch hydrolysates with sucrose or fructose-containing sugars to the action of specified amylases to produce oligosaccharide syrups containing transferred fructose. IFT

9 T 445
[Sweetening agent.]
Kyowa Hakko Kogyo Co. Ltd.
Japanese Patent 4808829 (1973) [Ja]
The patent covers dipeptide sweetening agents, such as L-aspartyl-L-homoserine ethyl ester. IFT

9 T 446
Makes natural sweeteners more versatile?
Cook, M. K.
Food Engineering 45 (5) 145-146, 151 (1973) [En]

The properties and applications of various glycyrrhizin products are discussed with special reference to ammonium glycyrrhizin (AG) and monoammonium glycyrrhizin (MAG). AG is about 50 time sweeter than cane sugar; in combination with sucrose, dextrose or fructose, synergism makes AG about 100 times as sweet as cane sugar. However, AG imparts a tan coloration which precludes its use in light coloured beverages; also at concn. ≤0.05% AG imparts a slight liquorice flavour, although sweetness is its main characteristic. AG can be purified to yield a white, crystalline product, MAG, in which the liquorice flavour is repressed. It is more costly than AG but can be used in a much wider variety of foods and beverages. AG is also used as a flavour potentiator, flavour modifier and as a foaming agent. AA

9 T 469
[Artificial sweetener.]
Mitsubishi Chemical Industries Ltd.
Japanese Patent 4811958 (1973) [Ja]

Food sweetening agents which are 10 × as sweet as cane sugar and have no bitter taste comprise salts of aminocyclohexane-carboxylic acids. IFT

9 U 599
Food additives. Saccharin and its salts.
USA, Food & Drug Administration
Federal Register 38 (101, May 25) 13733 (1973) [En] [Washington, DC, USA]

A review is given of the current status of toxicological studies of saccharin (i) and its salts. Teratogenic studies in mice, rats, hamsters, and rabbits show no marked differences from the controls. Na (i) yields a presumptive positive dominant lethal result. The host mediated assay and cytogenetic results are negative in vivo in rats. Bladder tumours occurred with Na (i) at 5% in a feeding study on rats. A 3 generation study with lifetime administration to the first generation offspring showed bladder tumours at the 7.5% level. Six other feeding studies are mentioned without results. Results may be related to manufacturing process. The Remsen-Fahlberg process (starting with toluene), used for the manufacture of most of the (i) used in the studies, produces as much as 5650 ppm impurities, tentatively identified as o-toluenesulphonamide, o- and p-sulphonylbenzoic acid, and an unknown compound of mol. wt. 169. The Maumee process (starting with phthalic anhydride) produces impurities 0.2 ppm. CAS

9 U 613
[Liquid glucose.]
Bulgaria, Komitet po Kachestvoto, Standartizatsiyata i Metrologiyata
Bulgarian Standard BDS 544-72 19pp. (1972) [Bg]

This standard, shich replaces **BDS 544-58**, applies to liquid starch for storage or industrial purposes, obtained by hydrolysis of corn starch. Physico-chemical requirements stipulated include: sp.gr at 20°C, ≥1.430; DM (by refractometry at 20°C), ≥80%; reducing substances, ≤42% for sweets, ≤43-58% for confectionery; acidity, ≤1.30°; free SO_2, ≤20 mg/kg; total ash, ≤0.3%; acid-insoluble ash, ≤0.1 pH, ≥4.6; caramel test, ≥130°C; As salts, ≤0.2 mg/kg; Cu salts, ≤12 mg/kg; Pb salts, ≤0.3 mg/kg; Zn salts, ≤10 mg/kg; free mineral acids, no tolerance. The standard also covers sampling, testing, packaging, storage, shelf life (2 yr) and transport. HBr

10 T 495
Dihydrochalcone sweetening agents.
Rizzi, G. P. (Procter & Gamble Co.)
United States Patent 3 739 064 (1973) [En]

Hesperetin dihydrochalcone, and certain homologues thereof, are dissolved in appropriate organic solvents and aqueous-organic solvents to provide novel sweetening compositions useful in flavouring edible products. Typical flavours include spearmint, apple, banana, pineapple and orange. IFT

10 T 519
[Preparation of dipeptide-alkyl esters.]
Stamicarbon NV
Netherlands Patent Application 7 115 944 (1973) [Nl]

Asparagyl-amino acid alkyl esters having a peptide bond are prepared by reacting in water a N-protected asparagic acid anhydride and a lower alkyl ester of an amino acid. The reaction is preferably carried out at a temp. of about 0°C and a pH of 4-12. N-formyl-asparagic acid anhydride is preferably used. The products are suitable as sweeteners. W&Co

11 J 1875
Sweetened peanut spread.
Billerbeck, F. W.; Everett, L. H.; Ritsema, C. T. (Gerber Products Co.)
United States Patent 3 749 587 (1973) [En]

A peanut butter sweetening agent composition contains ≥5 wt. % sweetening agent (in terms of the solids) and has a long shelf life substantially free of syneresis. IFT

11 L 800
Sugar substitute.
Frey, R. R. (Richardson-Merrell Inc.)
United States Patent 3 737 322 (1973) [En]

The utility of arabinogalactan as a low-calorie sugar substitute in food preparations is enhanced by treatment with saccharides and other edible polyhydroxy compounds. IFT

850
r-sweetener mixtures.
, G. P. (Procter & Gamble Co.)
ed States Patent 3 751 270 (1973) [En]
veetening compositions comprise a natural
co-dissolved with certain aglyconic
drochalcones. IFT

864
ence of dextrose and starch on texture of
hmallows and similar aerated confections.
on, E. B.
ectionery Production **39** (6) 319-322 (1973)

rbohydrate sweeteners and stabilizers as
dients and texture modifiers of marshmallows
iscussed. Effects of 42 DE (dextrose
valent) or 63 DE glucose syrups in preventing
allization of sucrose at solids concn. ≥75%, on
oscopic nature of the product through relative
ur pressure, on viscosity and on sweetness are
ined with the aid of tables. Properties of
tional (acid 42 DE), high maltose (acid-
me 45 DE) and high DE (acid enzyme 63 DE)
se syrups, dextrose monohydrate and
odextrins are outlined. High DE syrups have
sweetness value, reduced viscosity, superior
ping and excellent humectant properties, and
asy to handle at high solids. High maltose
os have equal sweetening power, higher
ture retention and lower hygroscopicity than
tional glucose syrup and prevent crystallization
xtrose at high dextrose concn. Dextrose
ohydrate has a tenderizing effect on texture,
ces viscosity and improves whipping properties.
o-dextrins reduce sweetness and increase
y" of marshmallows. Various modified waxy
e starches possessing strong gel forming ability,
ove shape retention and increase shelf life.

528
itol sweetener.
uhashi, M.; Hirao, M.; Sugimoto, K.
ashibara Co.)
ed States Patent 3 741 776 (1973) [En]
altitol is used as the major sweetener in low-
ie foods. IFT

529
icial sweetener.
stadt, M. E. (Cumberland Packaging Corp.)
ed States Patent 2 743 518 (1973) [En]
e bitter aftertaste of foods sweetened with
arin is reduced by incorporation of gluconic
and fructose. IFT

530
artyl-aminomalonic acid diesters. A new
p of compounds with intense sweetness.
o, M.; Wakimasu, M.; Tanaka, K.
rwissenschaften 60 (7) 351 (1973) [4 ref.
[Takeda Chem. Ind., Ltd., Higashiyodogawa,
a, Japan]

Following earlier literature reports on the dipeptide ester L-aspartyl-L-phenylalanine methyl ester (L-Asp-L phe-OMe) having × 100-200 the sweetness of sucrose but a similar taste, other dipeptide diesters of similar structure were investigated as possible sweeteners. A series of diesters in which the phenyl moiety was replaced by an aminomalonic moiety and with ester groups chosen from various alcohol moities (to give the general structure L-Asp-Ama-oR) was synthesised and evaluated for sweetness in comparison with sucrose solutions by a 7 - member panel. Data are given for 7 compounds, all of which were homogeneous by NMR, TLC and elemental C,H,N,O analysis. Uniquely intense sweetness was possessed by the trans-2-methylcyclohexyl methyl diester (5000 - 7000 × sucrose) and the fenchyl methyl diester (22 000 - 33 000 × sucrose). ELC

11 T 531
Sugar substitute.
Deutsche Laevosan-Gesellschaft C. F. Boehringer & Söhne GmbH & Co. KG.
British Patent 1 315 724 (1973) [En]
"Body", providing genuine hunger abatement, is given to saccharin sweeteners by incorporation of fructose and/or xylitol. IFT

11 T 532
Sugar substitutes.
Rizzi, G. P.; Neely, J. S. (Proctor & Gamble Co.)
United States Patent 3 743 716 (1973) [En]
Sweetening composition comprise a co-dissolved sugar alcohol, or glycerol, and an aglyconic dihydrochalcone. IFT

11 T 546
Sugar substitutes and enhancers.
Daniels, R.
Food Technology Review, Noyes Data Corporation 5, ix+275pp. ISBN O 8155 0492 6 (1973) [En]
Park Ridge, New Jersey, USA: Noyes Data Corp.
Price $36.00
The information in this book is based on US patents since 1960 relating to the manufacture and application of sugar substitutes and enhancers; where relevant some earlier patents and British patents are also included. Chapter headings are: Miraculin-glycyrrhizin-artichoke sweeteners (pp. 3-24); Dipeptides-chalcones-maltols (pp. 25-50); Other synthetic sweeteners (pp. 51-79); Saccharin combinations (pp. 80-103); Methods for increasing bulk of mixes (pp. 104-154); Reduced calorie products (pp. 155-188); Drinks, jellies and fruits (pp. 189-229); Desserts and baked goods (pp. 230-267). The appendix contains important directives by the US Food and Drug Administration on the status, use, and labelling requirements of effective combinations of such sugar substitutes and enhancers. Company, US patent number, British patent number and inventor indices are included
AA

11 T 567
[Biological effects and hygienic evaluation of cyclamates.] [Review]
Pinter, I.; Czuczy, P.
Elelmiszervizsgalati Közlemenyek **19** (1/2) 29-34 (1973) [31 ref. Hu, ru, de, en, fr] [Orsz. Elelmezes es Taplalkozastud. Intezet, Budapest, Hungary]

A review is given of the effects of cyclamates and the prohibition of their use in various countries. IF

11 T 576
Food additives. Recent developments in the food industry.
Pilnik, W.
Gordian **73** (5) 208-214; (6) 252-256; (7/8) 299-302, 305-307 (1973) [97 ref. En] [Dept. of Food Sci., Agric. Univ., Wageningen, Netherlands]

Developments in food additives are discussed including non-bitter soy protein hydrolysates for enriching fruit juices; dihydrochalcones, synthesis of pellartine; replacement of sugar by polyols or fructose; acidulants (citric, tartaric, malic, gluconic, adipic and fumaric acids); texturizers (alginates and carrageenan); determination of milk protein reactivity of carrageenan; pectin as thickener and stabilizer; microbial gums; toxicology of preservatives (nitrates, nitrites, diethyl pyrocarbonate and SO_2); isotope analysis for detection of adulteration with water; constituents of slimming diets; red beet powder; and flavours obtained by the Maillard reaction or Strecker degradation. RM

11 U 759
Mannitol and sorbitol. Affirmation of GRAS status of direct human food ingredients.
USA, Food & Drug Administration
Federal Register **38** (143, Jul. 26) 20046-20048 (1973) [En] [Washington, DC]

A summary is given of the published literature from 1920 to present as reported by the Select Committee on GRAS substances in the following areas: absorption from the gastrointestinal tract, short term feeding studies, teratologic tests, intraveneous injection, and mutagenic response. There is no evidence on sorbitol and mannitol that demonstrates a hazard to the public when used at current levels or reasonably expected levels. CAS

12 A 564
Sweet and bitter tastes of alicyclic and o-heterocyclic glycols.
Hodge, J. E.; Goodwin, J. C.; Warner, K.
Abstracts of Papers, American Chemical Society **166**, AGFD 118 (1973) [En] [N. Regional Res. Lab., USDA, 1815 N. University Street, Peoria, Illinois 61604, USA]

Toward establishing a stereochemical basis for sweet taste, the simplest hydroxylic compounds were investigated in various cyclic configurations and in relatively fixed conformations. The spacing requirements for glycol groups to induce a sweet taste were sought within a group of cis- and trans-1,2-, 1,3-, and 1,4-cycloalkanediols and methylcyclohexanediols. Also tested were o-heterocyclics; e.g., erythritan, levoglucosan, and o-substituted methyl glycosides. To gain information about conformations in solution, intramolecular hydrogen bonds were detected by IR measurements in hydrophobic media, and the complexing of cis-glycols with boric acid was detected by AC-conductivity measurements. Intensities of sweetness and bitterness of aqueous solutions were scored by a taste panel. The cis- and trans-1,2-cyclohexanediols do not induce a sweet taste. Both cis- and trans-1,3-cyclohexanediols and the cis-1,4-cyclohexanediol, but not the trans-, are sweet. Levoglucosan, with trans-diaxial (anti-periplanar) pairs of 3 vicinal hydroxyl groups, is definitely sweet. Each glycol was bitter in varying degrees; however, sweet and bitter intensity scores were reproducible by a trained panel. Modifications are needed in that part of the Shallenberger-Acree molecular theory which relates to spatial orientation of glycol groups that induce a sweet taste. AS

12 L 897
Sweetness of some (1'~2)-linked disaccharides.
Dick, W. E., Jr.; Hodge, J. E.; Inglett, G. E.
Abstracts of Papers, American Chemical Society **166**, AGFD 117 (1973) [En] [N. Regional Res. Lab., USDA, 1815 N. University Street, Peoria, Illinois 61604, USA]

In intensely sweet glycosides of natural origin (stevioside, oslandin, or glycyrrhizin) and in the dihydrochalcones derived from naringin and neohesperidin, the presence of (1'~2)-linked disaccharides is well known; however, few members of this class of sugars have been tested for sweetness as free sugars. Nine (1'~2)-linked disaccharides were prepared by condensing the appropriate 0-acetyl glycopyranosyl bromide with 1,3,4,6-tetra-0-acetyl-α-D-glucose. The D-xylo-, D-gluco-, and D-galactosyl bromides formed approx. equal amounts of the α- and β-linked disaccharides in overall yields of 60-70%, whereas the L-arabino-, L-rhamno-, and D-mannosyl analogues formed single products in 80-90% yields. Monosaccharide byproducts were removed by column chromatography, and disaccharide components were separated by fractional crystallization. The free sugars were compared, in 3% aqueous solution, to 0.5, 1.0, and 1.5% aqueous solutions of sucrose. Although none scored a sweetness value as high as that of D-glucose, an order of sweetness was established. AS

595
l additives. III.] [Review]
yama, S.
nics of Refrigeration and Airconditioning
o Kucho Gijutsu] **21** (248) 53-62 (1970) [Ja]
gulations for various food additives and
minants (including H_2O_2, coal tar-based
nts, SO_2 and related bleaching agents, Cl_2-
sterilizing agents, ClO_2, nitrogen peroxide,
, glutamates, sodium cyclamate, antibiotics
esticide residues) in Japan are discussed.
YY

613
nt status of sugar substitutes. [Review]
worth, N. R.
etics and Perfumery **88** (7) 27-35 (1973)
ef. En] [Coll. of Pharmacy, Univ. of Illinois,
Centre, Chicago, USA]

619
fluorometric determination of dulcin using
n nitrite. I. Establishment of quantitative
d and its application to food analysis.]
ama, S.; Kondo, T.; Kawashiro, I.
l of the Pharmaceutical Society of Japan
gaka Zasshi] **89** (6) 828-832 (1969) [9 ref.
[Dept. of Foods, Nat. Inst. of Hygienic Sci.,
, Kamiyoga, Setagaya-ku, Tokyo]
orometric determination of dulcin (4-
phenonylurea) involves the following steps.
l of dulcin solution in a test-tube with a
r is added 0.4 ml of 1N HCl, and the test
heated in a boiling water bath for 10 min.
cooling to room temp., 0.5 ml of 10% $NaNO_2$
n is added and the solution is allowed to
for 30 min at room temp. Then, 0.5 ml of 6%
solution is added and the solution is allowed
d for 40 min at room temp. Subsequently,
ution is extracted with 10 ml of $CHCl_3$ by an
atic shaker for 5 min. The $CHCl_3$ phase gives
escent spectrum with an excitation max. at
n and an emission max. at 446 nm. A straight
lationship between dulcin concn. and
scence intensity was obtained within the
1-8 μg/ml in $CHCl_3$. This method was
sfully applied to the determination of dulcin
e foods (e.g. jam, miso, kamaboko). AS

623
l feeding studies on miracle fruit
trate: a progress report.
reidge, K.; Bailey, D.; Dastoli, F.; Harvey,
lebi, G.
cts of Papers, American Chemical Society
GFD 72 (1973) [En] [Food & Drug Res.
c., Waverly, New York 14892, USA]
icle fruit concentrate (MFC) is a protein
n prepared from the fresh ripe berry of
alum dulcificum, a tropical shrub which has
dapted to plantation culture. MFC exhibits
the unusual property of modifying human taste response to acid foods by intensifying sweetness and flavour. Although the fruit has been subject to wide use as food in Africa, MFC is the object of intensive animal feeding studies which are still in progress. Preliminary data are presented covering growth and reproduction studies, including teratologic trials, through three generations of rats. Long term chronic studies are being initiated in rats and dogs. There have been no adverse affects of MFC observed to date. AS

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5.	Microwaves in Food Processing	160	£2.00	☐	103	£2.00	☐	£5.00
6.	Texture Analysis of Foods	426	£4.50 *	☐	429	£4.50	☐	£11.00
7.	Synthetic Dairy Products	150	£2.00	☐	88	£2.00	☐	£4.00
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13.	Deep Fat Frying	400	£4.00	☐	248	£2.50	☐	£7.00
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